

**FACT SHEET FOR NPDES PERMIT
NO. WA-002233-1**

CITY OF ROSLYN POTW

The City of Roslyn is seeking reissuance of its NPDES permit for its Publicly-Owned Treatment Works, (POTW). Roslyn is located in northwest Kittitas County, approximately 30 miles east of Snoqualmie Pass in central Washington. Roslyn is situated in a small valley drained by Crystal Creek, a tributary of the Yakima River. It is bound by the Cle Elum ridge to the northeast and Easton ridge to the west. The City of Roslyn POTW provides service to residential, commercial and public areas that include the City of Roslyn and the Kittitas County Water District No. 2 (KCWD #2), which includes the Town of Ronald, Washington. There are currently no industrial wastewater discharges to the City of Roslyn POTW.

The Roslyn POTW currently has 774 sewer service connections, including those located in KCWD #2. It consists of approximately 17 miles of sewer line, one lift station and the wastewater treatment plant. The treatment plant accomplishes a secondary level of treatment using three facultative stabilization ponds and a chlorine disinfecting system.

During the term of the last permit intermittent compliance violations occurred for BOD₅, total residual chlorine, total suspended solids, total ammonia and pH.

The Department of Ecology is currently reviewing *The City of Roslyn, Kittitas, WA Comprehensive Sewer and Wastewater Facility Plan Draft*, Gray & Osborne, Inc., July 2000, Publication #99439. The plan presents alternatives the City is considering for the future of the POTW. This fact sheet and permit address the existing facility. Information from the draft facility plan has been incorporated and referenced in this fact sheet.

This permit requires: a self-monitoring program to verify compliance with the established NPDES permit effluent limits; a hydrogeologic study to assess lagoon impact to the groundwater and Crystal Creek; a Crystal Creek receiving water study and increased monitoring for total ammonia; an I/I report that contains a plan and schedule for locating sources of I/I, a plan to correct I/I that includes a schedule of completion to be submitted to the Department for approval; annual reports indicating the progress of KCWD #2 I/I resolutions.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the U. S. Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington (State) on the basis of Chapter 90.48 RCW (Revised Code of Washington) which defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 Washington Administrative Code), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the State is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. This permit contains the technology-based effluent limitations as given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (Federal) and in Chapter 173-221 WAC (State). A preliminary assessment of the discharge's potential for exceedance of the water quality standards for chlorine and ammonia has been made. Where there is a lack of adequate data indicating the discharger's potential for exceedance of the water quality criteria, this permit does not include water quality-based numeric effluent limitations. Based on the Department's preliminary evaluation, the permit may include monitoring requirements and/or specified measures to control discharges of these toxic pollutants.

One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

This fact sheet has been reviewed by the Permittee and errors in fact have been corrected. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments (Appendix C) will become part of the file on this permit and parties submitting comments will receive a copy of the Department's response. This fact sheet will not be revised. Changes to the permit will be addressed in Appendix C--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Roslyn 201 South First Street Roslyn, WA 98941
Facility Name and Address	City of Roslyn Wastewater Treatment Plant Old #5 Mine Road Roslyn, WA 98941
Type of Treatment	Facultative Stabilization Ponds Secondary Treatment
Discharge Location	Crystal Creek, tributary to the Yakima River Latitude: 47° 12' 07" N Longitude: 120° 57' 03" W
Water Body ID Number	WA-39-1037

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

1. History

Roslyn's domestic wastewater was originally either disposed of on-site, treated at a small POTW or discharged directly to Crystal Creek. The original POTW was a sludge digester and chlorination facility constructed in 1927 at river mile 3 of Crystal Creek. In 1973, an old on-site coal-washing pond was converted into two (2) clay-lined facultative sewage treatment lagoons.

The POTW has had one major upgrade that was completed in 1989. The upgrade included the construction and/or installation of the following improvements:

- A. A third facultative lagoon used as a polishing pond for the effluent leaving the two parallel primary lagoons;
- B. A new headworks with a 6-inch Parshall Flume;
- C. Three (3) sewage level control structures;
- D. An additional mechanism for supplemental aeration prior to chlorination;
- E. A chlorinator and chlorine contact basin; and
- F. A new outfall to Crystal Creek.

In October of 1997, the Roslyn POTW began receiving wastewater from KCWD #2. The 1991 *Agreement for Wastewater Treatment and Disposal Service Between*

The City of Roslyn and Kittitas County Water District #2 governs this arrangement. The collection system for KCWD #2 is included in the collection system status section of this fact sheet.

EXISTING FACILITY

1. Collection System

A. The City of Roslyn

The City's original collection system was a combined stormwater-sanitary system constructed in the early 1900's with direct discharges to Crystal Creek. From 1973 to the present time, there have been three major collection system improvement projects (1973, 1985, & 1989) implemented to eliminate the discharge of untreated wastewater to Crystal Creek. The City of Roslyn collection system consists of approximately 13 miles of pipe.

City of Roslyn Collection System Inventory*

Year Constructed	Size	Type	Length
Pre- 1973 ⁽¹⁾	4", 6", 8"	Vitrified Clay	4,200 ft
1973	8"	ABS Truss	9,775 ft
1973	12"	Concrete	210 ft
1973	15"	Concrete	1,800 ft
1973	18"	Concrete	5,790 ft
1973	21"	Concrete	3,075 ft
1984	8"	PVC	38,000 ft
1988	8"	PVC	3,200 ft
1989	8"	PVC	550 ft
1989	16"	Ductile Iron	170 ft
1989	21"	Concrete	400 ft
		Total	67,170 ft

*Source: City of Roslyn Comprehensive Wastewater and Sewer Facility Plan Draft, Gray & Osborne, Inc., July 2000, Publication #99439, (pg. 3-2).

1-Length is approximate since record data for the sewer system prior to 1973 is not available.

B. Kittitas County Water District #2

In 1997 KCWD #2 completed construction of a pumping station, approximately 2 miles of 6-inch diameter force main, approximately 2 miles of sanitary sewer, a drainage system for accommodation of basement sump pumps and stormwater collection system that separates sanitary sewer and stormwater. The new KCWD #2 sanitary sewer collection system allows gravity flow to the lift station, which transfers flow to the force main. The force main transfers flow from the lift station to the Roslyn wastewater treatment plant. KCWD #2 collection system serves an approximate population of 175 utilizing a collection system of approximately 4 miles.

The collection systems of Roslyn and KCWD #2 consists of approximately 17 miles of sewers. The lift station is designed to handle 250 gallons per minute at 95 feet of total dynamic head.

2. Infiltration and Inflow, (I/I)

Historically, I/I has been a significant problem for the City of Roslyn. From 1973 to the present time, there have been three major collection system improvement projects (1973, 1985, & 1989), that have attempted to remove excessive inflow and infiltration (I/I). A sewer system evaluation survey done in 1981 indicated the average annual infiltration into the system was approximately 1.5 million gallons per day, (MGD). Average inflow was identified as approximately 0.3 MGD, with peaks up to 2.5 MGD during snow melt.

The 1981 survey prompted the City of Roslyn to replace the majority of the combined clay sewer drain lines with PVC lines in an attempt to address the I/I problem. This was completed during the 1984 – 1985 improvements. The City's plan was to utilize the old clay lines for stormwater collection in order to separate the sanitary sewer system and stormwater. Parts of the clay line system were damaged during the installation of the new PVC lines making them unusable for stormwater collection. Installation of the new PVC lines resulted in some of the existing service connections, (sanitary sewer, basement and foundation drains and/or pumps) being connected to the new PVC sewer lines. According to the City's NPDES Application Overview received by the Department July 10, 2000, the existing collection system consists of approximately 93% separate sanitary sewer and 7% combined storm and sanitary sewer.

The current excessive wastewater flows indicate a continuing problem with significant infiltration and inflow into the current collection system. According to the recent submittal of the *Comprehensive Sewer and Wastewater Facility Plan Draft*, Gray & Osborne, Inc., July 2000, average I/I has increased since the sewer line replacement was completed in 1985.

Average I/I and Peak Flow Increases¹

Year	Average I/I, MGD	Peak Flow, MGD
1986	0.48	0.5
1995-98	0.61	1.1

¹ Source: City of Roslyn Comprehensive Wastewater and Sewer Facility Plan Draft, Gray & Osborne, Inc., July 2000, Publication #99439, (pg. 4-12).

The *Comprehensive Sewer and Wastewater Facility Plan Draft*, Gray & Osborne, Inc., July 2000, indicates that portions of the Roslyn collection system were visually checked with a television system. Although the report was not inclusive of the entire collection system and did not identify all I/I sources, the following recommendations were made.

City of Roslyn – I/I Removal Work Recommendations

Problem	Repair	Estimated Amount of I/I to be removed
1. Leaks at manhole joints	Manhole repair	36 gpm ¹
2. Inflow through manhole lids and rim seals	Install inflow protectors	Not quantified
3. Leaks at cleanouts	Repair cleanouts	2 gpm
4. Leaking clay pipe	Replace clay pipe on East Pennsylvania Ave.	20 gpm
5. Leaks at mainline side sewer connections and joints	Repair mainline side sewer connections and joints	26 gpm
	Total	84 gpm

1 gpm is gallons per minute.

City of Roslyn Comprehensive Wastewater and Sewer Facility Plan Draft, Gray & Osborne, Inc., July 2000, Publication #99439, (pg. 4-43).

Even though KCWD #2 has significantly improved its sanitary sewer collection system, the Department remains concerned with the I/I levels being sent to the Roslyn wastewater treatment plant. In an effort to resolve this concern, a September 28, 2000 correspondence was received by the Department from Gray & Osborne. This correspondence addresses the KCWD #2 I/I as follows: Annual reports will be submitted to the Department that will include quarterly flows, maintenance and system conditions and progress made in the elimination of all illegal connections to the KCWD #2 collection system. These annual reports will be submitted through the year 2004. Existing resolutions will be enforced regarding illegal basement pumps and

unrehabilitated side sewers. Illegal basement pumps will be removed from the KCWD #2 system by **October 31, 2002**.

3. Treatment Plant

The POTW uses facultative stabilization lagoons to provide secondary treatment for the City of Roslyn's wastewater. The present treatment facility consist of a headworks with a Parshall flume, two 5.25-acre clay-lined primary stabilization lagoons, one 5.43-acre 20-mil PVC-lined secondary stabilization lagoon, pre-chlorination aeration facilities, a chlorination area with a chlorine contact basin and a post aeration system.

In accordance with Chapter 173-230 WAC, the Roslyn POTW is classified as a Class I facility. The treatment plant classification criteria are based on treatment plant type and design flow.

The principal treatment plant operator of this system must be a Class I operator certified by the State of Washington.

A. Headworks

The collection system directs wastewater into the Roslyn wastewater treatment plant through a 21-inch diameter concrete gravity trunk main. The headworks consists of a small concrete open channel structure with a 6-inch wide Parshall flume measuring device and a ultrasonic level sensor. The influent wastewater to the Parshall flume is not screened. This is the influent composite sampling point. Wastewater exits the flume and flows into the flow control manhole about 150 feet away through a 16-inch iron pipe. The flow control manhole divides the flow and directs it into lagoon #1 or lagoon #2 through two 14-inch diameter HDPE pipes.

The flume has previously experienced backup and overflow occurrences. During influent backups and overflows the Parshall flume flow measurements may exceed the chart recorder limits, in which case flow measurements would not be recorded or inaccurately recorded. The lack of a screen at the entrance to the Parshall flume may allow large debris and rags into the system, also resulting in inaccurate flow readings.

B. Lagoons

The City of Roslyn POTW operates three facultative lagoons in its wastewater treatment process. Two of the lagoons are operated in parallel, covering an area of 5.25-acres each. These lagoons, #1 and #2, provide a combine total storage

volume of 16.2-million gallons. The lagoons were constructed in 1973 with clay liners and have a total depth of 8-feet with a maximum operating depth of 6-feet, minimum of 3-feet.

Lagoon effluent flows through a 12-inch iron outlet pipe to a level control structure. An adjustable aluminum weir maintains constant water levels in both lagoons. The lagoons are also connected to each other with a 12-inch PVC pipe. This interconnecting pipe provides some variable depth control and flow regulation between the first two lagoons. Effluent wastewater from lagoons #1 and #2 flow from the weir into lagoon #3 via a 16-inch iron pipe.

Lagoon #3 was constructed in 1988 to provide a longer wastewater detention time and allow for a lower chlorination dosage rate. Lagoon #3 was constructed of a 20-mil PVC liner overlain with nine inches of sand. It covers an area of 5.43-acres with a total storage volume of 10.25-million gallons. Lagoon #3 is operated in series with lagoons #1 and/or #2.

All three lagoons utilize one submerged rock filter each, designed to aid in removing algae from the lagoon effluent. A 36-inch wide adjustable aluminum cipoletti weir controls the wastewater levels in lagoon #3. Based on an average wet weather design flow of 0.44 MGD, the three lagoons provide a total theoretical detention time of 39 days. The actual detention time is less than 39 days because measured average monthly flows have typically exceeded the design wet weather flows.

The *Comprehensive Sewer and Wastewater Facility Plan Draft*, July 2000, contains a theoretical water balance that was performed on data collected from 1995 to 1998, (narrative on pg. 3-10, data calculations in Appendix E). This preliminary analysis indicates lagoon leakage. The impact of wastewater leakage into the ground water has been an ongoing concern to the Department. Correspondence of June 7, 1999 from the Department to the City of Roslyn indicates the need for the City to line lagoons #1 and #2 with a geomembrane and/or perform a hydrogeologic study and groundwater monitoring. The basis for this study is to determine the adverse impact of the leaky lagoons on the ground water. Other lagoon system deficiencies noted in the facility plan include inadequately sized submerged rock filters and vegetation growth around the lagoon dikes that can compromise the integrity of the clay liners.

C. Effluent Aeration and Chlorination

Wastewater from lagoon #3 enters the aeration basin from the east end of the chlorine contact tank. Air is introduced into the 10-feet by 26.75-feet basin

through two 4-inch parallel headers with diffusers. At the airflow rate of 150 cubic feet per minute (cfm), the basin is completely mixed and the residence time during average wet weather daily flow of 0.44 MGD is over one hour. The effluent then flows into the effluent 6-inch Parshall flume where flow is monitored by an ultrasonic level sensor. The wastewater exits the Parshall flume and flows into the chlorine contact tank. The chlorine contact tank is composed of two cells each 4-feet wide and approximately 135-feet long. This system allows operation in one or both cells. The tank holds 54,000 gallons when the water is 6.7-feet deep.

Chlorine is injected into the wastewater effluent at the Parshall flume, delivered at a rate proportional to the effluent flow. The chlorine injector has a capacity of delivering 25 pounds of chlorine gas per day. There is a standby chlorine gas cylinder and injector installed with an automatic switchover system. *The City of Roslyn Wastewater Treatment Operation and Maintenance Manual*, June 1990, Gray & Osborne, Inc., pg. 3-10. contains the following chlorine contact tank detention time information:

Chlorine Contact Tank Detention Times and Flows

Wastewater Flow Rate, (MGD)	Detention Time, Minutes
0.22	178 (one cell)
0.44	178 (two cells)
1.5	52 (two cells)

The wastewater passes through rotating scum skimmers at the end of the chlorine contact tank and enters the post aeration system. The post aeration basin is 5-feet 4-inches wide and 23-feet long, supplying a total capacity of 50 cfm air to the wastewater. (Use of the post aeration system is not consistent because it creates foam which would be discharged to Crystal Creek). Inconsistent operation of the post aeration system is noted in the *Roslyn Post-Upgrade Wastewater Treatment Plant Limited Class II Inspection and Receiving Water Study on Crystal Creek*, 1991 and was confirmed by the operator during the last inspection, on August 11, 2000. Effluent composite samples are taken at the post aeration basin weir.

4. Discharge Outfall

Treated and disinfected effluent is discharged from the facility via an 8-inch outfall, which discharges into Crystal Creek, a Class A waterbody. The effluent flows 275-feet from the treatment plant to the Crystal Creek outfall. The Roslyn POTW discharges seasonally (typically from October through May). When discharging, the discharge is

continuous through a non-submerged (at low receiving water flows) pipe. According to the wastewater treatment plant operator, the outfall is submerged approximately 60% of the time when the facility is discharging. Crystal Creek continues downstream for approximately 1.6 miles, where it flows into the Yakima River, at River Mile 183.1.

A domestic water overflow was redirected in 1993-1994, which caused a change in the volume of water flow in Crystal Creek. Due to this move, current receiving water flow data for Crystal Creek is needed to more accurately determine effluent discharge permit limits.

5. Residual Solids

The Department requires that the City measure the level of accumulated sludge in each lagoon each year during this permit cycle. These measurements will be submitted to the Department annually. The removal of sludge from the lagoons is not expected to be needed during the life of this proposed permit.

There are minor quantities of incidental solids (rags and other debris) removed as part of the routine maintenance of the equipment. These are drained and disposed of as solid waste at the local landfill. Since the influent line to the headworks and Parshall flume is not screened, everything goes into the lagoons.

SOILS, HYDROLOGY AND GEOLOGY

The soils around Roslyn are composed primarily of silt stones, sandstones, coal and shale. Coal was mined commercially around Roslyn until the 1960s. Approximately 90% of the coal was removed from the larger seams leaving mine spoils that are characterized as stony, sandy loam. The lagoons are located in an area that consists primarily of coal mine tailings. These comprise most of the area around the Roslyn facility. Sandy loam soils are highly erodible, with water permeabilities between 0.6 and 6.0-inches per hour. Mine dumps typically have water permeabilities of between 0.6 and 20-inches per hour.

Measurements taken at the closest well, about 1/4-mile from the wastewater treatment plant, indicate that the groundwater elevation is approximately 100-feet below ground level. Mined out areas around the wastewater treatment plant allow groundwater flow, influencing the groundwater level. According to Department of Ecology's publication, *Roslyn Wastewater Lagoons and Crystal Creek Receiving Water Study*, dated October 21, 1985, there is water that flows from the Number Five Mine fanhouse northwest of the wastewater treatment plant. The water had an alkaline pH an ammonia level of 0.009 mg/L.

PLANNED IMPROVEMENTS

The City of Roslyn is currently in the process of making a decision on the future of the Roslyn wastewater treatment facility. The Department of Ecology and the City of Roslyn are in the process of reviewing the *City of Roslyn, Kittitas County, WA Comprehensive Sewer and Wastewater Facility Plan Draft*, July 2000, G&O #99439. The two options presented in this plan are to join the Cle Elum regional wastewater treatment facility or to upgrade the existing facility to comply with the NPDES permit.

WASTEWATER CHARACTERIZATION

INFLUENT AND EFFLUENT CHARACTERIZATION DATA BELOW ARE FROM THE CITY'S NPDES FORM 2A APPLICATION OVERVIEW DATA, EXCEPT WHERE NOTED.

Parameter	¹ Influent data 1999 - 2000		Effluent data 1997 - 2000	
	Influent Average Monthly	Influent Maximum Monthly	Effluent Average Daily Discharge	Effluent Maximum Daily Discharge
Flow (MGD)	0.27	1.33	0.32	0.90
BOD ₅ (mg/L)	108.5	200.0	9.14	23.5
BOD ₅ (% Removal)	NR	NR	87.9 ¹	99.4 ¹
TSS (mg/L)	148.1	334.4	9.5	53.9
Fecal Coliform (# per 100 mL)	NR	NR	6.5	96
Total Residual Chlorine (mg/L)	NR	NR	0.13	0.28
Ammonia Nitrogen (mg of N/L)	NR	NR	4.05	8.58
Temperature, summer (F ⁰ /C ⁰)	NR	NR	64 ⁰ /18 ⁰	65 ⁰ /18 ⁰¹
Temperature, winter (F ⁰ /C ⁰)	NR	NR	38 ⁰ /03 ⁰	47 ⁰ /08 ⁰
pH range	NR	NR	low pH = 7.4	high pH = 9.8

NR = Not Recorded

¹ Data is from DMR's, dated 1/99 to 7/00.

1. Influent

The *City of Roslyn, Kittitas County, WA Wastewater Management Alternatives Screening Report*, September 1998, G&O #97733, states on page 4-26 that, based on treatment plant flow records, I/I can contribute well over 50% of plant flows. In extreme cases, it is estimated that I/I has contributed more than 75% of plant flows. On page 3-20 of the *City of Roslyn, Kittitas County, WA Comprehensive Sewer and Wastewater Facility Plan Draft*, G&O, July 2000 states that BOD₅ removal rate violations can be attributed to the dilution of influent with I/I. This level of I/I being added to the sanitary sewer flow can dilute influent concentrations of the permitted parameters. Thus the influent wastewater is characterized as having lower concentrations and loadings of BOD₅ and TSS due to I/I dilution factors.

2. Effluent

The POTW typically discharges effluent from October to May. In the summer, lagoon evaporation rates have usually exceed influent rates. The effluent, when discharged, has periodically exceeded the permit limits for pH, TSS, Chlorine, BOD₅ and Ammonia. Elevated pH and TSS concentrations appear to be directly related to increasing lagoon temperatures and the associated algal blooms. According to the *Roslyn Post-Upgrade Wastewater Treatment Plant Limited Class II Inspection and Receiving Water Study on Crystal Creek*, Willms, 1991, the downstream receiving water violates the State's surface water quality standards for temperature and chlorine for a Class A waterbody, (see Description of Receiving Water on page 18 of this fact sheet). The temperature of the water upstream from the outfall meets water quality standards.

The City of Roslyn *Comprehensive Sewer and Wastewater Facility Plan Draft*, July 2000, page 3-20 states that the existing POTW cannot meet the BOD₅ removal rates and will have a difficult time meeting the effluent ammonia limits required in the previous and proposed permit. The effluent limits for Total Residual Chlorine, Ammonia, Fecal Coliform and BOD₅ were derived from a Total Maximum Daily Loading (TMDL) study of Crystal Creek (Willms, 1991) conducted by the Department and submitted to the EPA on March 9, 1992. In its approval, on February 12, 1993, the EPA noted that: "The City of Roslyn has been identified as the major point source of ammonia-nitrogen, chlorine, fecal coliform bacteria and BOD to Crystal Creek. Wasteload allocations (WLA's) for these pollutants will be incorporated into NPDES permit WA-002233-1 for the City of Roslyn." It is expected that the necessary improvement in effluent quality can be satisfactorily met through an engineered upgrade of the facility.

PERMIT STATUS

The previous permit for this facility was issued on February 29, 1996 and placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, Total Residual Chlorine and Total Ammonia as N.

An application for permit renewal was submitted to the Department on 7/7/00 and accepted by the Department on 7/10/00.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its most recent class 1 inspection, without sampling, on August 11, 2000. This inspection was conducted during a period of no discharge from the wastewater treatment facility. This inspection found:

- Headworks had no screen to remove large debris
- A gate design error in the abandoned chlorine contact chamber.
- Third lagoon had an algae bloom which is unusual according to the operator.

The following concerns are consistent with those concerns described in the fact sheet from the previous permit.

- Effluent discharge permit violations
- Significant quantities of I/I
- Potentially adverse effects on groundwater and/or surface water due to lagoon leakage
- Vegetation around the stabilization pond.

Comparison of Interim Limits to Final Limits in 1996 Permit

Parameter	Monthly Average Interim Limits (2/29/96 to 9/30/99)	Weekly Average Interim Limits (2/29/96 to 9/30/99)	Monthly Average 1996 Final Limits (10/1/99 to 11/7/200)	Weekly Average 1996 Final Limits (10/1/99 to 11/7/200)
BOD ₅	20 mg/L, 234 lbs/day	30 mg/L, 350 lbs/day	11 mg/L, 113 lbs/day	17 mg/L
BOD ₅ , removal	NA	NA	68% or better	
TSS	35 mg/L, 409 lbs/day	53 mg/L, 619 lbs/day	32 mg/L, 374 lbs/day	48 mg/L, 560 lbs/day
Fecal Coliform Bacteria	100 colonies/100 mL	200 colonies/100 mL	59 colonies/100 mL	118 colonies/100 mL
Total Ammonia	5.0 mg/L, 58 lbs/day ²	NA	2.40 mg/L, 9.70 lbs/day ¹	NA
Total Residual Chlorine	0.5 mg/L, 5.8 lbs/day ²	NA	0.02 mg/L, 0.08 lbs/day ¹	NA
pH	Shall not be outside the range 6.0 - 9.0			

1- Daily Maximum

The City was authorized to discharge treated wastewater to Crystal Creek regulated by the interim effluent limits, through a companion order that was issued with the permit on February 29, 1996. The interim limits were based on the past performance of the POTW.

According to the companion order, the final limits could not be consistently met until improvements were made to the wastewater treatment facility. The improvements were to be identified and installed prior to September 30, 1999, the date that the interim limits expired. An Administrative Order dated November 7, 2000, extended the interim limits to March 1, 2001.

NPDES Permit Violations Reported on DMRs Dated 3/96 to 7/00

Parameter	# of Violations
BOD	3
TSS	1
pH	6
Total Ammonia	15
Total Residual Chlorine	8

BOD₅ monthly average effluent permit limits were exceeded three times during January, February and March, 2000.

TSS average weekly effluent permit limits were exceeded once, during May, 2000.

Total ammonia daily maximum effluent permit limits were exceeded ten times during the interim limit period. Five more ammonia violations of the daily maximum effluent permit limit occurred after the September 30, 1999 interim limits expiration date.

Total residual chlorine daily maximum effluent permit limit was in violation October 1999 to May 2000, following the expiration of the interim period on September 30, 1999.

The pH levels exceeded the effluent permit limit requirements a total of six times between March 1996 and July 2000. The violations were seasonal, occurring during March and April.

The majority of the requirements in the Summary of Scheduled Permit Report Submittals, (page 4) in the previous permit were completed by the City of Roslyn. The Department of Ecology granted two extensions for the City's submittal of the Plan for Maintaining Adequate Capacity, (PMAC). The *Comprehensive Sewer and Wastewater Facility Plan Draft, City of Roslyn, Kittitas County, Washington*, G&O #99439 was submitted to the Department on July 17, 2000. One of the required two I/I evaluations was included in the Draft Comprehensive Plan.

PROPOSED PERMIT LIMITATIONS AND CONDITIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC) or Sediment Quality Standards (Chapter 173-204 WAC). The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

DESIGN CRITERIA

In accordance with WAC 173-220-130(1)(a), effluent limitations shall not be less stringent than those based upon the design criteria for the facility, which are contained in approved engineering plans, reports, or approved revisions. Also, in accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for the Roslyn POTW has been exceeded 10 times between March 1996 and September 2000. Exceedance of the design criteria occurred in January 1996; January, February, March, and April of 1997; February 1998; January, February and March of 1999 and February of 2000.

The following design criteria are taken from the *City of Roslyn, Wastewater Treatment Facilities Operation and Maintenance Manual*, prepared by Gray and Osborne, Inc., June 1990, page 1-4 except where noted:

Design Data for The City of Roslyn WWTP

Parameter	Design Criteria
Average daily dry weather flow (MGD)	0.22
Average daily wet weather flow (MGD)	0.44
Peak (MGD)	1.5
BOD monthly average (lbs/day)	192 lbs/day
Design population equivalent (# of people)	1070 ¹

City of Roslyn Wastewater Treatment Facilities Operation and Maintenance Manual, June 1990, Gray & Osborne, page 1-4.

¹City of Roslyn Final Pre-Design Report Schedule "B" Wastewater Treatment Plant Modification, February 1987, G&O No. 86534, page II-5.

The *Comprehensive Sewer and Wastewater Facility Plan Draft*, Gray & Osborne, Inc., July 2000, was prepared to provide the City with a plan to treat and dispose of wastewater for a twenty year planning period. This draft offers alternative plans based on the City's need to

comply with current Washington State water quality regulations. The draft facility plan acknowledges in the description of the existing POTW, that the facility exceeds capacity at times and does not meet final water quality NPDES permit requirements for some parameters.

The draft facility plan includes background information on the POTW, planning considerations, detailed descriptions of the existing facility, a brief I/I analysis, wastewater flows and loadings, collection system capacity evaluation, regulatory requirements, wastewater treatment and disposition alternatives. The plan contains an evaluation of several alternatives and identifies the following as the most cost effective and environmentally acceptable. These two options are:

- 1) Continue to treat and dispose of wastewater at the existing location.
- 2) Join a regional wastewater and disposal facility under evaluation by the City of Cle Elum.

The following upgrades and/or changes are to be considered, if the City chooses to continue wastewater treatment at the existing site.

- Relocate the existing WWTP outfall and obtain a mixing zone.
- Modify the existing WWTP with a nitrifying trickling filter and dechlorination.
- Construct a water reclamation facility and land apply effluent at agronomic rates.
- Replace the lagoon-based system with an extended aeration activated sludge process.

This draft facility plan is currently under review by the City of Roslyn and the Department of Ecology.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The City of Roslyn POTW discharges to receiving water which does not meet State quality standards for Class A water as defined in Chapter 173-201A WAC. In addition, the receiving water flow is very low, and reportably non-existent during the dry months. As a result, no mixing zone can be granted to the discharge. Analysis from the 1991 Crystal Creek Receiving Water Study indicate that if technology-based limits in Roslyn's permit were approached during a low flow period, water quality problems would result. Therefore, the creek is water quality limited for these parameters. The existing permit limits for each parameter are water quality-based, except for pH.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a State regulation designed to protect the beneficial uses of the surface waters of the State. WAC 173-

201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. Water quality-based effluent limits were based on wasteload allocations, (WLA's) developed during a specific Total Maximum Daily Loading (TMDL), as included in the most recent receiving water study conducted by the Department, *Roslyn Post-Upgrade Wastewater Treatment Plant Limited Class II Inspection and Receiving Water Study on Crystal Creek*, Willms, 1991, and subsequently approved by the EPA.

CONSIDERATION OF SURFACE WATER QUALITY-BASED CRITERIA

Applicable Class A water quality-based criteria are defined in Chapter 173-201A WAC for aquatic biota and can be summarized for this discharge as follows:

Fecal Coliforms:	100 colonies/100 mL maximum geometric mean
Dissolved Oxygen:	8 mg/L minimum
Temperature:	21°C maximum (special condition)
pH:	6.5 to 8.5 standard units
Turbidity:	less than 5 NTU above background
Toxics:	No toxics in toxic amounts

The Department has reviewed existing records and has determined that ambient water quality in the receiving water is lower than the designated classification criteria given in Chapter 173-201A WAC. Specifically, the discharge has the potential to create a barrier to the migration or translocation of indigenous organisms. In the proposed permit, the Department will use the appropriate designated classification criteria for this water body. The discharges authorized by the proposed permit should not cause a degradation of existing water quality or beneficial uses.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Mixing zones are authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC. Dilution of receiving water to effluent at the "critical" conditions were determined by the receiving water study. The ambient "critical" condition flow is the 7Q10, is the lowest seven-day average river flow with a recurrence interval of ten years. The City of Roslyn POTW effluent's chronic and acute dilution factors, at "critical" conditions, were both determined to be significantly less than 1:1. Therefore, the Department will not allow any dilution zone in Crystal Creek for the POTW final effluent.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Crystal Creek, a small stream approximately three miles long which averages 2 to 6 feet in width and 0.5 feet in depth. The creek drains approximately 7.7 square miles of forested foothills around the cities of Roslyn and Cle Elum. Crystal Creek discharges to the north side of the Yakima River, at River Mile 183.1. Crystal Creek is classified as a Class A waterbody.

Characteristic uses of a Class A waterbody include the following: Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses in accordance with WAC 173-201-030-2(a).

The 1998 section 303(d) list does not include Crystal Creek. The previous permit states that Crystal Creek was 303(d) listed at that time. Since the previous permit cycle, March 1, 1996 to March 1, 2001, total maximum discharge limits have been developed, which dropped Crystal Creek from the 303(d) list.

CRYSTAL CREEK RECEIVING WATER STUDIES

The receiving water was described as violating several of the State's water quality criteria in three receiving water studies conducted by the Department Anderson and Egbers, 1978, Joy, 1985 and 1990 Willms, 1991. The proposed permit effluent limits are consistent with the previous permit and are based on the most recent Willms, 1991 study, *Roslyn Post-Upgrade Wastewater Treatment Plant Limited Class II Inspection and Receiving Water Study on Crystal Creek*. The objectives of this study were to:

- Assess water quality impacts from wastewater discharge, including a Total Maximum Daily Load, (TMDL), analysis to determine effects under critical design conditions.
- Evaluate the wastewater treatment plant removal efficiency and NPDES permit compliance.
- Recommend activities to improve the effectiveness of the Roslyn wastewater treatment plant and protect the quality of Crystal Creek.

The study results were based on intensive surveys conducted at the Roslyn facility on September 10, 11 and 12, 1990. The weather during the study was observed as dry and warm with low stream flow conditions. The wastewater treatment plant had not been discharging from June to August 1990 and the lagoons had been drawn down for weed control the preceding spring. It took several months to bring the lagoons back up to discharge level. Discharge began seven days before the beginning of the study, (September 4, 1990). Due to the extended wastewater

detention time in the lagoons over the summer the effluent analysis results may represent a higher level of treatment.

The study indicates that the effluent analysis results are "...fairly consistent with the Discharge Monitoring Reports, (DMRs) for April and May 1990, and wastewater treatment plant results reported in the 1985 Ecology study, indicating that the September 1990 data was representative of summer effluent quality." The benthic macrovertebrate community data may also contain some bias due to the shorter WTP effluent exposure to the organisms.

The primary limitations of the Willms, 1991 receiving water study are discrepancies in the POTW design criteria flow numbers and the stream flow data used to calculate the waste loads and final effluent limits.

To completely understand the situation of the City of Roslyn, the applicable water-quality based TMDL's for Crystal Creek and respective Waste Load Allocations (WLAs) for the City's POTW must first be considered. The EPA approved the Department's TMDLs for Crystal Creek on February 12, 1993. These approved TMDLs apportioned to the POTW were established as numerical mass-based effluent limits, or WLAs, for the following four parameters:

Parameter	WLA	Respective Monthly Average Concentrations	Respective Weekly Average Concentrations	Respective Daily Maximum Concentrations
Ammonia	9.70 lbs/day	N/A	N/A	2.4 mg/L
Chlorine	0.08 lbs/day	N/A	N/A	0.02 mg/L
Fecal coliform	41,100 cfu/sec	59 colonies/100 ml	118 colonies/100 ml	N/A
BOD ₅	113 lbs/day	11 mg/L	17 mg/L	N/A

Despite the limitations of this study, it represents the most current and accepted basis for the development of discharge effluent limits intended to protect the water quality in Crystal Creek. More current data are needed to assess the impact of the Roslyn wastewater discharge on Crystal Creek. The requirements of this permit include submittal of a water quality evaluation on Crystal Creek.

The previous studies, listed on page 16 under Crystal Creek Receiving Water Studies, indicate that low ambient dilution of the effluent in the receiving water caused surface water quality violations of fecal coliform bacteria, chlorine, and temperature.

Those studies specifically concluded that the City of Roslyn would need: (1) to continue correcting I&I problems; (2) to add effluent dechlorination, or an alternative disinfection process; (3) to have water quality-based effluent limits in the permit.

The above water quality-based WLA's, approved by EPA, are used in the proposed permit because they are more stringent than the alternative technology-based limits. All of the above water quality-based WLA limits are more stringent than the technology-based limits. Since TSS was not analyzed during the study, the proposed permit will contain effluent limits based on past performance of the POTW.

The impacts of dissolved oxygen deficiency, temperature, pH, fecal coliform bacteria, and toxics were determined as shown below:

BOD₅

The impact of BOD₅ on the receiving water was modeled at "critical" conditions utilizing the technology-based effluent limitation for BOD₅ described under "Technology-Based Effluent Limitations", above. Under "critical" conditions there was predicted a violation of the water quality standards for surface waters. Therefore, the more stringent water quality-based WLA effluent limitation for BOD₅ was placed into the proposed permit.

Temperature

The impact of the discharge on receiving water temperature was modeled at "critical" conditions. Under "critical" conditions there was no predicted violation of the water quality standards for surface waters. Therefore, no temperature limit was placed into the proposed permit.

pH

The impact of the discharge on receiving water pH was modeled at "critical" conditions at a maximum effluent pH of 9.0 since the effluent pH is typically high. Under "critical" conditions there is no predicted violation of the water quality standards for surface waters. The predicted resultant pH at the boundary of the discharge/receiving water was 9.0. Therefore, the technology-based limitation was placed into the proposed permit.

Fecal Coliform Bacteria

The numbers of fecal coliform bacteria were modeled using the technology-based limit of 200 colonies per 100 ml. Under "critical" conditions there was predicted a violation of the water quality fecal coliform criterion for the receiving water. Therefore, the more stringent water quality-based WLA limitation was placed into the proposed permit.

Toxic Pollutants

Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals whenever there is a reasonable potential for those chemicals to exceed the receiving surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters, or from having surface water quality-based effluent limits.

Ammonia and chlorine were determined to be present in the discharge and to have a reasonable potential, under “critical” conditions, to cause violations of the State’s water quality standards. The proposed permit will incorporate the water quality-based WLA final effluent limits for both of these parameters since those limits were more stringent than the applicable technology-based limits.

Whole Effluent Toxicity

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from the Permittee’s discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no WET testing is required in the proposed permit. If the POTW influent changes significantly which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require effluent characterization in a regulatory order, by permit modification, or in the application for permit renewal.

Human Health

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health. The discharge will be re-evaluated for impacts to human health at application for permit renewal.

Interim limits are provided based on performance of the POTW. Interim limits allow a period of time for the permittee to implement improvements that will enable the facility to meet the final permit limits. With the exception of ammonia, the interim limits provided in the proposed permit are the same as the previous permit’s companion order dated February 29, 1996. The

City of Roslyn is required to identify and install improvements to the wastewater treatment plant with the intent of meeting the final permit limits, if they should decide to continue discharging to Crystal Creek.

CRITICAL CONDITIONS

Determination of the reasonable potential for exceedance of the surface water quality standards are made for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

CHLORINE CONSIDERATIONS

Discharges from wastewater treatment plants that use chlorine for coliform control are likely to have a reasonable potential for chlorine toxicity, unless, dechlorination is installed or other chlorine control methods are implemented at the plant, and there is adequate dilution of the effluent by the receiving water.

Acute and chronic toxicity criteria for total residual chlorine, (TRC), are 0.019 and 0.011 mg/L respectively (Chapter 173-201 WAC). A mixing zone is not authorized for the Roslyn POTW, consequently the acute limit must be met at the discharge point, (end of pipe). At 10 feet below the Roslyn wastewater treatment plant outfall, acute and chronic toxicity would occur across 75 percent of the stream width. Based on conservative calculations, mixing was complete at 40 feet. TRC would exceed acute and chronic toxicity across the entire stream. This could potentially create a barrier to fish passage in the vicinity of the outfall. (Washington State Department of Ecology publication "*Roslyn Post-Upgrade Wastewater Treatment Plant Limited Class II Inspection and Receiving Water Study on Crystal Creek*, 1991, page 10.)

The proposed final effluent permit limits are consistent with the previous permit. The stringent Total Residual Chlorine limit of 0.02 mg/L may require that dechlorination or an alternative disinfection method be employed. These limits are given due to the lack of adequate dilution from the receiving water which makes the TMDL water quality-based limitations necessary. In order that the City's effluent not further degrade existing water quality in Crystal Creek, should the Permittee choose to continue discharging there, the POTW effluent will be required to comply with the final effluent limits.

AMMONIA CONSIDERATIONS

A reasonable potential determination for exceedance of the ammonia criteria caused by this discharge cannot be made without adequate data on the ammonia concentration in the effluent and data on the flow, temperature, pH, and ammonia concentration in the receiving water under the critical condition. Calculations of the ammonia criteria under various conditions suggest that

there is no reasonable potential for exceedance of the water quality standards when the receiving water pH and temperature are below 8 and 68 °F (20 °C), respectively. However, as the background ammonia nitrogen concentration in the receiving water increases to 0.5 mg/L or higher, the reasonable potential analysis suggests the exceedance of the chronic ammonia criteria. If there are indications of high receiving water pH, temperature, or ammonia, the permit will require extensive ambient flow and water quality monitoring and/or implementation of immediate measures for control of ammonia in the discharge.

Based on the information available, there is a potential for exceedance of ammonia criteria in the receiving water. In order to make a reasonable potential determination, the permit requires the City of Roslyn to perform a preliminary investigation of parameters values needed for such determination.

This permit increases the monitoring schedule for ammonia. A recommendation was made in the August 1991 Receiving Water Study to implement a weekly ammonia monitoring schedule. Due to concerns the Department has regarding previous effluent ammonia violations, this permit increases monitoring for ammonia from once per month to once per week.

COMPARISON OF EFFLUENT LIMITS WITH THE PREVIOUS PERMIT

Parameter	Existing Permit Limits		Proposed Permit Limits	
	Monthly Average	Weekly Average	Monthly Average	Weekly Average
BOD	11 mg/L	17 mg/L	11mg/L	17 mg/L
TSS	32 mg/L 374 lbs/day	48 mg/L 560 lbs/day	32 mg/L 374 lbs/day	48 mg/L 560 lbs/day
Fecal Coliform	59/100 mL	118/100 mL	59/100 mL	118/100 mL
pH	6 to 9 standard units		6 to 9 standard units	
	Existing Daily Maximum Permit Limits		Proposed Daily Maximum Permit Limits	
BOD	113 lbs/day		113 lbs/day	
Ammonia	2.40 mg/L, 9.70 lbs/day		2.40 mg/L, 9.70 lbs/day	
Chlorine	0.02 mg/L, 0.08 lbs/day		0.02 mg/L, 0.08 lbs/day	

The effluent limits in this permit are unchanged from the final limits established in the previous permit. The established interim limits are also the same as the previous permit with the exception of ammonia. The interim limit for ammonia was re-calculated because exceedance of the previous interim limit occurred thirteen times. Interim limits are provided with the purpose of allowing time for a facility to achieve compliance with the final permit limits. Interim limits are based on the performance of the facility. The proposed Roslyn POTW interim limit for ammonia was established from the DMR data reported from March 1996 to September 2000.

The proposed interim limits are as follows:

INTERIM EFFLUENT LIMITATIONS ^a : OUTFALL # 001			
Parameter	Monthly Average	Weekly Average	Daily Maximum
Biochemical Oxygen Demand ^b (5-day)	20 mg/L, 234 lbs/day	30 mg/L, 350 lbs/day	N/A
Total Suspended Solids	35 mg/L, 409 lbs/day	53 mg/L, 619 lbs/day	N/A
Fecal Coliform Bacteria	100 colonies/100 mL	200 colonies/100 mL	N/A
Total Ammonia	N/A	N/A	12.7 mg/L, 58 lbs/day
Total Residual Chlorine	N/A	N/A	0.5 mg/L, 5.8 lbs/day

^a The monthly and weekly averages are based on the arithmetic mean of the samples taken with the exception of fecal coliform bacteria, which is based on the geometric mean.

^b The monthly average effluent concentrations for BOD₅ shall not exceed thirty-two percent (32%) of the respective monthly average influent concentrations.

SCHEDULE OF COMPLIANCE

A reassessment of the design criteria loadings is a required condition of the proposed permit. A facility plan is to be submitted to the Department that will propose plans, specifications, and an implementation schedule that will address exceedances of the current design criteria. A construction quality assurance plan as specified in the **Schedule of Compliance S8.A.** of the proposed permit is required.

In an effort to gain a more representative understanding of Crystal Creek receiving water and the Roslyn POTW's discharge potential to exceed water quality standards, a receiving water study is a requirement of this permit. The requirements of this study are specified in the proposed permit under **Schedule of Compliance, S8.C.** The additional receiving water data collected and increased monitoring of ammonia in the effluent discharges will provide the basis for an accurate determination of reasonable potential analysis for the next permit renewal.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

The Department is concerned that the City of Roslyn wastewater treatment plant lagoons may be impacting the ground water beneath the lagoons and Crystal Creek. The State's Ground Water Quality Standards state:

WAC 173-200-100(4) Permits reissued by the department shall be conditioned in such a manner as to authorize only activities that will not cause violations of this chapter;

WAC 173-200-100(4)(b) For reissued permits, the permit holder shall evaluate the impacts of its activities on ground water quality, and, if necessary to achieve compliance with ground water quality enforcement limits, determine a Department approved schedule of compliance.

Due to the proximity of the lagoons to Crystal Creek this permit will require a hydrogeologic study to evaluate both surface water and ground water characteristics. Characterization of Crystal Creek will require monitoring above and below the lagoons. The information collected in the study will be used to establish a monitoring plan that will include designs of a ground water quality monitoring devices network and details of the location and monitoring device construction designs. The monitoring schedule in the Monitoring Plan will also include surface and ground water testing.

This permit requires that an assessment of the lagoons' impacts to ground water and surface water be conducted, as specified in Special Condition S9, **GROUND WATER QUALITY EVALUATION (HYDROGEOLOGIC STUDY)**.

MONITORING AND REPORTING

Effluent monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring and testing schedule is detailed in this permit under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual*.

The permit requires additional monitoring to determine the reasonable potential for exceedance of the ammonia and chlorine effluent limitation criteria. The parameters to be monitored include

the ammonia concentration in the effluent, and the receiving water ammonia concentration, pH, and temperature.

OTHER PERMIT CONDITIONS

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of this permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in Special Condition S4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Special Condition S4. restricts the amount of flow.

INFILTRATION AND INFLOW, I/I

The July 2000 Draft Comprehensive Facility Plan identifies the importance that the City address the continuing I/I problems. This proposed permit requires a comprehensive I/I report subject to Department approval, which includes:

- A system analysis that includes a flow event of above 1 MGD into the wastewater treatment plant.
- An cost effectiveness analysis of alternative plans
- A schedule of remediation of I/I
- A financial program describing a funding plan designed to support scheduled remediation activities
- Annual reports on the KCWD#2 collection system, stating quarterly sanitary sewer flows to the Roslyn POTW, maintenance review and system conditions, and the progress of the elimination of all illegal basement pumps.

OPERATION AND MAINTENANCE (O & M)

This permit contains Special Condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

A current O&M Manual is required to ensure efficient operation of the City of Roslyn POTW. The current O&M manual is dated June 1990 and may not include current operating procedures.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for: Chlorine, Total Residual; Dissolved Oxygen; pH; Solids, Total Suspended; Biochemical Oxygen Demand; and Fecal Coliforms. The Roslyn Wastewater Treatment Plant Laboratory is accredited by the State of Washington Department of Ecology for the above parameters until July 31, 2001.

GENERAL CONDITIONS

General Conditions are based directly on State and Federal law and regulations and have been standardized for all individual NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended State or Federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five (5) years.

REVIEW BY THE PERMITTEE

A proposed permit was reviewed by the Permittee for verification of facts. Only factual items were corrected in the draft permit and fact sheet.

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 18, and July 25, 2000 in the Ellensburg Daily Record to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on February 8, 2001 in the Northern Kittitas County Tribune to inform the public that a draft permit and fact sheet were available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (509) 575-2821, or by writing to the address listed above.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART--An acronym for "all known, available, and reasonable methods of prevention, control, and treatment" and includes best management practices, as may be stipulated by the Department.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation --The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the Federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Class 1 Inspection--A walk-through inspection of a facility that includes a visual inspection and some examination of facility records. It may also include a review of the facility's record of environmental compliance.

Class 2 Inspection--A walk-through inspection of a facility that includes the elements of a Class 1 Inspection plus sampling and testing of wastewaters. It may also include a review of the facility's record of environmental compliance.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Daily Maximum Discharge Limitation--The greatest allowable value for any calendar day.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a collection system through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of rainfall-caused surface water drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a collection system.

Interference--A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

1. Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
2. Therefore is a cause of a violation of any requirement of the POTW's permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewer sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SWDA), sludge regulations appearing in 40 CFR 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through--A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit on the discharge concentration and/or mass of an effluent parameter which is based on the ability of a treatment method, or methods to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate material in a wastewater or effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the discharge concentration and/or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--RESPONSE TO COMMENTS

Response To Comments On The Proposed Roslyn POTW NPDES Permit March 21, 2001

Plant Operator Comments:

#1. Existing treatment plants inability to meet proposed interim limits for the following parameters based on demonstrated plant performance. Section S1A.1.

*Effluent BOD
Effluent TSS (algae blooms)
Effluent Ammonia Limit
Effluent pH (algae blooms)
Effluent Ammonia mass limit
Effluent residual chlorine mass limit*

Response:

The interim limits proposed in the permit were unchanged from the previous permit with the exception ammonia. The ammonia interim limit was increased from 5 mg/L to 8.2 mg/L in the initial draft permit. This number was based on a statistical analysis of effluent data submitted to the Department via DMR's from 3/96 to 7/00. The same statistical analysis method was applied to the data with the addition of the most recent DMR ammonia data. The recalculation, which includes the additional data from 11/00 to 2/01, raised the interim ammonia limit to 12.7 mg/L.

The City of Roslyn has demonstrated that the exiting facility can meet the interim limits the majority of the time. The Department will not increase the BOD, TSS, pH, Chlorine and the associated mass interim limits for the following reasons:

pH: The pH limits are based on technology-based standards.

TSS, BOD and Fecal Coliform bacteria: The permit limit exceedances from 3/96 to 2/01 occurred less than 10% of the time.

Chlorine: The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and

Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis.

Mass Limits: The mass load limits are dictated by the design criteria for the plant. Chapter 173-220-130 (1)(a) WAC states: "The effluent limitations shall not be less stringent than those based upon the treatment plant design efficiency contained in approved engineering plans and reports or approved revisions thereto."

What about Section G15 – G18?

General Conditions – Penalties for Violating Permit Conditions (G15), and Duty to Comply (G18).

Response:

The Washington State Department of Ecology Executive Policy #7, Ecology Exercises Discretion Under Certain Circumstances, states: "The Ecology enforcement manual details a number of discretionary factors which are to be considered when issuing an enforcement action. Discretion shall be utilized in determining appropriate enforcement response when unique or mitigating circumstances have been clearly established by the responsible party. In all cases, discretion shall be exercised judiciously to maintain an overall consistent enforcement effort. Consequently, the use of discretion is to be applied primarily to the following areas: nonsignificant violations (marginal exceedances or nonaggravated emissions); the use and terms of administrative orders (consent or unilateral); application of enforcement escalation; or derivation from the Ecology enforcement manual. Enforcement discretion shall be noted and justified in the Recommendation for Enforcement."

#2. Inability to stay within rated capacity of the existing treatment plant for the following parameters. Section S4.A.

Average daily wet weather flow

Peak flow

Influent BOD Loading

Response:

The design criteria in S4.A. are from the facility design, which dictates specifications on the plant ability to treat wastewater. The Department cannot change the engineering specifications the plant was constructed to. The design criteria numbers are not effluent limitations. They are used as indicators that the plant is approaching maximum capacity or overload.

When the actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three (3) consecutive months, or when the projected increases would reach design capacity within five years, whichever occurs first, the Permittee submits to the Department, a plan and a schedule for continuing to maintain capacity at the facility sufficient to achieve the effluent limitations and other conditions of the permit.

The Department has received a draft Plan for Maintaining Adequate Capacity (PMAC) from the City of Roslyn and is aware that the City is working toward resolving current capacity issues.

*#3. Requirement to disconnect all foundation drain discharges by October 31, 2002 (Section S4.C.3). It is highly unlikely that the City could obtain funds, plan, design and construct storm water conveyance facilities in such a short period of time. We assume Ecology and County approval will be required to design and construct such facilities, which will also add to time requirements. Reduction of I&I before plant upgrade will result in more frequent and serious permit violations for BOD and ammonia. Etc. Basement drain removal will require in most cases cutting a trench in the existing homes basement floor, wall and yard to install two new pipes – one storm and one sanitary sewer. *Note some areas no storm option at curb exists. Also city storm system is what is left of the early 1900 combo sewer system. It seems prudent to check the condition of this system prior to connecting basement drains and pump to it.*

Response:

The Department has incorporated the schedule that the City submitted, changing the date in the permit from 10/31/02 to 5/31/06.

#4. Plant reliability classification is identified as Class I – this may require back-up power source (section S5.D.)

Response:

The Department has incorporated the City's request for a Class II reliability for the existing plant. Since the previous permit included a Class II and no changes have been made to the facility, a Class II is acceptable to the Department for the existing plant. At such time that upgrades are made to the treatment plant, a Class I reliability will be required.

#5. Requiring plans and specifications 90 days after the facility plan is due (Section S8.A.1.). This does not provide sufficient time to obtain funding, and complete design. Without the Earthtech Regional Facility Plan we do not know what option will be selected by city council. April 15, 2002 seems enough time to complete our facility plan. 90 days for completion of design and financing is not an achievable deadline. If council chooses the regional alternative we don't know – who will be designing the system and preparing plans and specs or if the necessary modification of our plant to connect to the regional system will be designed by the regional system engineer or not. Governance of the regional system has not been worked

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our. Roslyn can't force this issue since we have not decided which option is best for us and our ratepayers.

Response:

The Department has incorporated the schedule that the City submitted, changing the submittal date in the permit for plans and specifications to 12/15/03.

The Department has also changed the final facility plan submittal date to 10/31/01 from 4/15/01, in response to the schedule submitted with the City's comments.

#6. Immediately implementing measures for compliance with interim limits (Section S8.B.). It is unclear what is expected – too vague, places City at risk. What are these measures? We can't assure compliance without plant upgrade! Department of Ecology knows this! Risk? G18-G15 etc. How can we agree to permit conditions we know we can't meet!

Response:

The permittee needs to efficiently operate and implement measures that will work toward compliance with the interim limits. As stated above under comment #1, The Washington State Department of Ecology Executive Policy #7, Ecology Exercises Discretion Under Certain Circumstances.

#7. Compliance deadline for limits (Section S8.B.3.). Deadline of July 1, 2004 gives the City a little more than three years to comply. Highly ambitious given that it can take several years alone to obtain funding necessary to design and construct improvements on this scale. We will not have the information to make a decision for regional verses stand alone alternatives until Earthtech regional study is complete (summer 2001). This is another permit condition that we cannot meet. G18-G15!! Risk!

Response:

The Department has incorporated the schedule that the City submitted, changing the dates from 7/1/04 to 5/31/06. As stated above under comment #1, The Washington State Department of Ecology Executive Policy #7, Ecology Exercises Discretion Under Certain Circumstances.

#8. Receiving water monitoring (Section S8.C.). City will incur additional O&M costs for labor and lab expense. May be of questionable benefit if City goes to regional facility. The City is not sure of its capability to conduct this monitoring using its staff. Flow and BOD are major concerns.

Response:

The proposed permit was written to address the existing facility. If the City continues to discharge to Crystal Creek, current data is necessary to establish background data to determine effluent impact on the creek.

The Department has incorporated the receiving water schedule the City submitted, changing the dates from 9/01 to 3/02.

In recognition of the limited staff the City has, the Department has decreased the monitoring schedule to twice per year for 3 years. The Department can provide technical assistance on estimating flow measurements.

#9. Groundwater quality evaluation (Section S9). States that continued use of lagoons will dictate this study. Does this hold true even if the City is required to reline its lagoons per Ecology's previous written direction? Is this requirement consistent with other treatment plants that use earthen basins for their treatment processes (e.g., West Richland, Mattawa)? May be difficult to establish ground water flow direction/velocity and background water quality due to potential for multiple hydraulic gradients in an area known to contain substantial volumes of fill and old coal mine shafts. Even if the City does this study, what will be the actual benefit of spending the dollars in this kind of effort? Hydro-geologic study due date October 15, 2003. Construction to commence 60 days after review and approval. Please note that the construction season is generally May through October. Please do not require winter construction of monitoring wells.

Response:

The ground water quality evaluation is required by the Ground Water Quality Standards (Chapter 173-200 WAC) and is intended to establish the basis for a focused monitoring program that will assess the impact of the city's lagoons on ground water quality. The department's position on lagoons and lining relative to the Ground Water Quality Standards is found in the *Implementation Guidance for the Ground Water Quality Standards* (Publication 96-02, April 1996). The department does not have a policy requiring double lining of lagoons such as those operated by the city. The exception would be if the department determined that such lining was necessary under the antidegradation requirements in the Ground Water Quality Standards or the Surface Water Quality Standards. Such requirement has not been determined for the city's lagoons. The department does require that permits for lagoons that are not double lined with leak detection must be conditioned to protect ground water quality. The permit for the city was written assuming that the lagoons would not be double lined and as a result a monitoring program to assess lagoon impacts was required. In order to properly design an efficient and effective monitoring program, a ground water quality evaluation is necessary. The monitoring and ground water evaluation requirements in the city's permit were worded to allow flexibility in the ground water quality evaluation process and design of the monitoring program. In particular,

pains were taken to ensure that the permit language would not be interpreted that monitoring wells would be viewed by the department as the sole mechanism for monitoring ground water quality. During a recent meeting with the city staff and consultants, the proximity of the lagoons to Crystal Creek and the likelihood that ground water migrates downhill/downgradient from the lagoons to the creek was discussed. If that is the case, a monitoring program of seeps and springs on the creek bank could be considered representative of ground water quality. The department is willing to work with the city to develop a cost effective plan to satisfy the ground water requirements in the permit.

#10. Status of Cle Elum regional facility evaluation. If is unfortunate that Ecology has chosen to impose a compliance schedule on Roslyn well ahead of a similar type of imposition on Cle Elum. Compliance schedule in draft permit may not allow Roslyn sufficient time to review and understand its options with the regional plant. How is Ecology attempting to coordinate the Cle Elum NPDES permit renewal with the Roslyn permit renewal? DOE has indicated a preference for the regional solution. Roslyn has no such preference. Hopefully the city council decision will be made based on what is best for our ratepayers and provides the most longevity in terms of solving our permit compliance problems (ie: ammonia). We do not control the regional facility plan preparation. According to Mike Ceka, Cle Elum City Administrator, the regional plan may be complete by early summer 2001. Governance of the regional system has not been worked out. We have no advance knowledge of the plan content. We are concerned that this compliance schedule sets deadlines that are not possible to meet and place unnecessary risk on the city. How can we agree to comply when we know we can't. The City of Roslyn is extremely concerned about this proposed permit for the following reasons: DOE has proposed in the draft permit interim and final effluent limitations that our existing plant can't meet without a plant upgrade. DOE is well aware that this is true. Also this permit has unrealistic deadlines for compliance with final effluent limits. The City of Roslyn is not far enough along in its planning to secure funding for the required improvements. This is due to delays in preparation of the regional facility plan currently underway by the City of Cle Elum. How can we agree to a compliance schedule when we are uncertain about how we can fund the required work. The requirements to remove I&I, plan and construct ground water monitoring system and prepare plans and specifications and achieve compliance by July 1, 2004 is not a realistic deadline. Violation of this permit's effluent limitations and compliance deadlines is certain. It seems dangerous to accept a permit we know in advance we can't comply with.

Response : Comment noted.

Response to Gray & Osborne's comments to the City of Roslyn regarding the proposed permit:

#1. Gray & Osborne's Comments on proposed NPDES Permit for the City of Roslyn

1. General Comment.

The timing of this permit renewal places the City in a difficult position given the status of the engineering reviews currently underway by the City of Roslyn, the City of Cle Elum and Trendwest Resorts for a regional wastewater treatment and disposal facility. This permit has the potential to force the City of Roslyn to make decisions about the future of its sewer utility without having all the information necessary to make such a decision and proceed with the acquisition of funding to implement solutions.

Response:

The City is required to have a NPDES permit to discharge to state waters. The proposed permit is designed to cover the existing plant, not to direct a decision on future treatment options.

#2. Section SIA.1-Interim Effluent Limits

The existing treatment plant risks exceeding the proposed interim limits shown in Table I for the reasons indicated. Risks are identified as "low", "high" and "certain".

*A **low risk** indicates that the WWTP has not exceeded the proposed limit in the last five years, but that a risk exists because the treatment system is not designed to achieve the limit. Therefore, if the lagoon were to ever approach a more typical operation (i.e., year round discharge and reduced 1/1 in the wet weather month), the treatment plant could violate the limit.*

*A **high risk** indicates either*

*(1) That the WWTP has exceeded the proposed limit, albeit at a limited frequency, (possibly due to unusual operating conditions for this system. e.g. low wet weather flows)
or*

(2) the lack of process control needed to reliably meet the limit presents a significant risk of violation.

*A **certain risk** indicates that the WWTP has frequently exceeded the proposed limit and is expected to do so again.*

Response:

Response to comments concerning interim effluent limits S1.A.1. is provided under #1 of the plant operator comments.

Additional Response:

There is always a risk that the interim limits will be exceeded at some time during the five-year permit cycle period. Limits are based on 95% confidence limits not 100%. This procedure is outlined in the Department of Ecology's Permit Writers Manual, page IV, section 1.8, Converting Performance to Limits.

Increasing the interim effluent limits for the Roslyn POTW would be considered "backsliding". This is not allowed by either state or federal rule and would be inappropriate considering the performance record of the existing facility.

The effects of flow reduction will be considered as the I/I work is completed and the progress reports are received. The Department and the City will work together at that time to determine appropriate actions.

#3. Section S4.A, Prevention of Facility Overloading

The plant capacity indicated in the draft permit is based on a 1987 Engineering Report that had not accounted for the high VI flows the plant currently experiences. The risk of exceeding the allowed flows based on historical records is summarized in Table 2.

TABLE I

Risk of Exceeding Interim Limits
City of Roslyn Draft NPDES Permit of January 30, 2001

Parameter	Limit	Risk of Exceeding Reason
Effluent BOD5 Concentration	Monthly Weekly 20 mg/L 30 mg/L	High High

Historically, the treatment plant only discharges during wet weather and ceases to discharge during the dry weather. This phenomenon is due to the extreme difference in between wet weather and dry weather flows as well as the fact that the lagoons lose more water (due to evaporation and leakage) than they take in during the summer months. However, during the winter of 2000-2001 the City experienced unusually low III resulting in effluent BOD5 concentrations well above historical norms. In January 2001 the effluent BOD5 exceeded 20 mg/L on two occasions and the monthly average BOD5 was 32.8 mg/L

Effluent BOD5 Mass	Monthly Weekly 234 lb/day 350 lb/day	Low Low
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Based on past performance the lagoon is not likely to exceed these limits. However, if effluent BOD5 were on the order of 30 mg/L (which it was in January 2001) and flows were on the order of 1 MGD (which they commonly are during wet weather, the proposed monthly limit would be exceeded. By comparison, typical lagoon effluent BOD5 limits, as allowed by WAC 173-221-050, are 45 mg/L and 65 mg/L on a monthly and weekly basis, respectively

Effluent TSS Concentration	Monthly Weekly 35 mg/L 53 mg/L	Low Low
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Lagoon treatment systems are not designed to achieve typical secondary standards for effluent suspended solids (30 mg/L). Although the WVVTP has generally met this limit in the past, it is primarily because of the unique way that the lagoon is operated (no summer discharge) that effluent TSS violations have not occurred. By comparison, typical lagoon effluent TSS limits, as allowed by WAC 173-221-050, are 45 mg/L and 65 mg/L on a monthly and weekly basis, respectively

Effluent TSS Mass	Monthly Weekly 409 lb/day 619 lb/day	Low Low
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Lagoon treatment systems are not designed to achieve typical secondary standards for effluent suspended solids (30 mg/L). Although the WWTP has generally met this limit in the past, it is primarily because of the unique way that the lagoon is operated (no summer discharge) that effluent TSS violations have not occurred. By comparison, typical lagoon effluent TSS limits, as allowed by WAC 173-221-050, are 45 mg/L and 65 mg/L on a monthly and weekly basis,

respectively. Based on typical lagoon performance, these limits could be exceeded at higher flows

TABLE 1

Risk of Exceeding Interim Limits
City of Roslyn Draft NPDES Permit of January 30, 2001
(Continued)

Parameter	Limit	Risk of Exceeding Reason
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Effluent Ammonia Mass	Daily 58 lb/day	High
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Lagoon treatment systems are not designed for ammonia removal and have particularly poor performance in this respect during cold weather. The limit should be based on the expected peak day flow for the interim period and the highest expected effluent ammonia concentration expected during the interim period. Historic peak day flows have been as high as 2 MGD; at this flow rate the effluent ammonia must be less than 3.4 mg/L to comply with the proposed limit. There is no guarantee that the lagoon could consistently achieve < 3.4 mg/L year round. Assuming effluent ammonia concentration during the high flow periods is not higher than 9 mg/L (historical records), a more appropriate mass limit would be on the order of 150 lb/day.

Effluent Ammonia Concentration	Daily	8.2 mg/L
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Certain Lagoon treatment systems are not designed to remove ammonia and have particularly poor performance in this respect during cold weather. During the winter of 2000-2001, the City experienced unusually low I/I. I/I normally dilutes sanitary wastewater flowing into the City's sewer and causes low ammonia concentrations in the lagoon effluent that are not typical for this type of treatment. In December 2001 and January 2001, the lagoon effluent had ammonia concentrations of 9.16 mg/L and 15.8 mg/L, respectively, both of which exceeded the proposed interim **limit**. Based on typical low ammonia removals in lagoon systems, a more appropriate limit (based on a weak to medium strength influent) would be on the order of 35 mg/L.

Effluent Residual Chlorine Mass	Daily	5.8 lb/day	High
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Although the City does not normally have high residual chlorine in its effluent, the WWTP lacks a dechlorination system.

Without a dechlorination process the effluent residual chlorine could easily exceed 0.5 mg./L. At this level a peak day flow of 2 MGD, would result in an effluent TRC of 8.34 lb/day.

Effluent pH	Daily	6 < pH < 9	Low
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Lagoons are subject to algae blooms in the spring and summer months. The high levels of photosynthesis during these periods depleted dissolved carbon dioxide, causing elevated pH in the lagoon. This phenomenon makes all lagoons subject to pH swings that can cause the interim limit to be exceeded, particularly the upper limit. The limit is normally not violated because there is no summer discharge.

TABLE 2

**Risk of Exceeding Permitted Capacity
City of Roslyn Draft NPDES Permit of January 30, 2001**

Parameter	Permitted Highest Actual (1993-1998) Risk of Exceeding			
Average Daily Dry Weather Flow	0.22 MGD	0.135	MGD	Low
Average Daily Wet Weather Flow (Maximum Month Flow)	0.44 MGD	0.632	MGD	Certain
Peak Flow	1.4 MGD	> 2	MGD	Certain
Influent BOD5	192 lb/day	374	lb/day	Certain

During the meeting between the City and Department of Ecology, the City requested that Ecology clarify in its Fact Sheet that exceeding the above limits does not constitute a permit violation.

Additionally, when Ecology develops interim limits for mass discharges (BOD, TSS, Ammonia, Residual Chlorine), the City requests that Ecology consider the impact of using the permitted flows as a basis for calculating mass limits. As noted in the previous comments, high winter flows create a risk of exceeding the mass limits.

Response :

This comment references S4.A. and is addressed under #2 response of the Plant Operator Comments.

Additional Response:

The mass effluent limits use design criteria data from the engineering specifications from the wastewater plant construction plans. The Department acknowledges that this engineering plan is dated, but it is the only approved design upon which to base the permit. The plant has operated under this design criteria for at least two permit cycles. It does not seem reasonable to spend time and money to change these numbers. The Department believes all efforts should be aimed toward the

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determination of how to upgrade or replace the existing plant, including considering all options available.

#4. Section S4.C.3, Requirement to disconnect all foundation drain discharges by October 31, 2002.

It is highly unlikely that the City could fulfill this requirement in less than 20 months. At a minimum, assuming funding was immediately available for both, an engineering study (to more clearly define the magnitude of the problem and identify the most cost effective method of diverting the flows) and design would take up to 20 months to complete. However, given the limited funding available for stormwater control projects, it could take significantly longer to complete. Disconnecting the drains without having an alternative stormwater conveyance system could lead to significant property damage. See proposed schedule for addressing this requirement.

Response:

The Department has incorporated the schedule the City submitted changing the date from 10/31/02 to 5/31/06.

#5. Section S5.D, Plant Reliability Classification

The draft permit identifies the WWTF as Class 1, which would require back-up power for critical process components, lighting and ventilation during peak flow events. The plant does not have an auxiliary power system. Will Ecology waive the requirement for auxiliary power until the plant improvements are completed?

Response:

This comment references S5.D. and is addressed under #4 response of the Plant Operator Comments.

The Department has incorporated the City's request for a Class II reliability for the existing plant. Since the previous permit included a Class II and no changes have been made to the facility, a Class II is acceptable to the Department for the existing plant. At such time that upgrades are made to the treatment plant, a Class I reliability will be required.

#6. Section S8A. 1, Requirement to submit plans and specifications 90 days after Facility Plan is due.

This does not provide sufficient time to obtain funding and complete the design. Ecology will not fund design work until a facility plan is approved and typical time period from funding application to receipt of funds is 7 months (210 days). Design of this magnitude typically takes a minimum of 12 months (360 days). Therefore, minimum time requirement (assuming an optimal funding scenario) is 570 days from the time a facility plan is approved until plans and specifications are completed. See proposed schedule for addressing this requirement.

Response:

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The Department has incorporated the schedule that the City has submitted, changing the submittal date for plans and specifications to 12/15/03.

The Department has also changed the final facility plan submittal date from 4/15/01 to 10/31/01, in response to the schedule submitted with the City's comments.

#7. Section S8B, Requirement to immediately implement measures for compliance with interim limits.

This requirement is vague and places the City at risk. What measures are being referred to? Would be more appropriate to establish a schedule for completing the facility plan, completing the design and constructing the improvements. This schedule should not be requested until after the City has had the time to review its options and make a decision whether to pursue a regional treatment facility option. Funding availability and timing of funding acquisition will have a significant impact on this schedule. See proposed schedule for addressing this requirement.

Section S8.B.3, Compliance Deadline for Final Limits of July 1, 2004

It is highly unlikely that this deadline will provide sufficient time to obtain funding, complete the design and perform construction. Ecology will not fund design work until a facility plan is approved and typical time period from funding application to receipt of funds is 7 months (210 days). Design of this magnitude typically takes a minimum of 12 months (360 days), with. Assuming a second round of funding applications is needed to fund construction, an additional 24 months would be needed before construction is completed. Therefore, minimum time requirement (assuming an optimal funding scenario) is 43 months from the time a facility plan is approved until construction is completed. See proposed schedule for addressing this requirement.

Response:

This is addressed in #6 of the Plant Operator Comments.

The Department has incorporated the schedule that the City submitted changing the date from 4/15/02 to 12/15/03.

This comment references S8.B.3. and is addressed in #7 of the Plant Operator Comments, which changes the date from 7/1/04 to 5/31/06.

#8. Section S8.C, Receiving Water Monitoring

This comment is for the City's consideration only. The City should consider the costs for additional laboratory work and adjust their sewer utility budget accordingly.

Response:

This comment is addressed in #8 of the Plant Operator Comments, that changes the date from 9/01 to 3/02.

#9. Section S9, Groundwater Quality Evaluation

This section essentially states that if the City continues to use lagoons as part of its treatment process (we assume it includes using them for flow equalization to manage VI), that a hydrogeologic study is required.

This apparently means that even if the City installs new liners in all of its lagoons, a hydrogeologic study is needed,

We question whether this requirement is consistent with Ecology's approach for other treatment facilities that use lined earthen basins for their treatment processes (examples: West Richland, Mattawa, Goldendale-both current and future).

If the study is performed it may be difficult to obtain meaningful information without expending significant amounts of money. The presence of substantial volumes of fill and abandoned coal mine shafts in the area will make it difficult to establish hydraulic gradient, groundwater velocity and upgradient water quality because there may be multiple hydraulic gradients.

The time, expense and uncertainty associated with this requirement presents a significant risk to the City both in terms of the potential costs involved and the level of accuracy that can be obtained from the information obtained in the study.

Response:

This comment is addressed in #9 of the Plant Operator Comments.